

CLAIMS

we claim:

5 1. A communications system comprising:

a communication distribution network;

a plurality of communication cable access units coupled to the communication distribution network, at least one of the cable access units each receiving power from a respective power supply powered by a main power source, said power supply including a backup power source adapted to supply power to an associated cable access unit when the main power source fails, said power supply further adapted to generate status information on the backup power source, at least one of the cable access units adapted to monitor the status information generated by said respective power supply and to check and record the capability of the cable access unit to acquire said status information;

10 an operator unit coupled to said network, said operator unit adapted to monitor, for at least one of the cable access units, the capability of the cable access unit to check and record said status information and also the backup power source status information via two-way communication with said cable access unit; and

15 a user interface coupled to said operator unit, and said operator unit adapted to display an indication of the monitored status information on said user interface.

2. A system as claimed in claim 1, wherein the power supply is further adapted to generate said status information on the backup power source wherein said status information generated is selected from at least one of backup power source on information, backup power source missing information, and backup power source needing replacement information.

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3. A system as claimed in claim 2, wherein said operator unit is further adapted to generate an alarm message, including an identification of the associated cable access unit, on the user interface when status information on the backup power source is received from said associated cable access unit indicating a backup power source on condition detected at the monitored cable access unit.

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4. A system as claimed in claim 2, wherein said operator unit is further adapted to generate an alarm message, including an identification of the associated cable access unit, on the user interface when status information on the backup power source is received from said associated cable access unit indicating at least one of a backup power source on, a backup power source missing, and a backup power source needing replacement condition detected at the monitored cable access unit.

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5. A system as claimed in claim 4, wherein the operator unit is further adapted to monitor backup power source status information from a plurality of cable access units located at respective different subscriber premises.

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6. A system as claimed in claim 5, wherein the operator unit is further adapted to maintain at least a partial count of the number of cable access units respectively reporting a backup power source on condition within a predetermined service area.

5 7. A system as claimed in claim 6, wherein the operator unit is further adapted to display on the user interface a generalized indication of a service area wide warning condition in lieu of individualized indications for each cable access unit when the count of the number of cable access units reporting a backup power source on condition exceeds a predetermined value.

10 8. A system as claimed in claim 4, wherein said backup power supply is a secondary alternating current power feed.

9. A system as claimed in claim 4, wherein said backup power supply is a generator.

15 10. A system as claimed in claim 4, wherein said backup power supply is a fuel cell.

11. A system as claimed in claim 4, wherein said backup power supply is a solar cell.

12. A system as claimed in claim 4, wherein said backup power supply is a battery.

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13. A system as claimed in claim 1, wherein the cable access unit further comprises a hardware unit adapted to detect the status information from the power supply, and a processor unit adapted to check whether the cable access unit can acquire the backup power source status information and to receive the status information from the hardware unit when acquired and also report said status information back to said operator unit via said network responsive to a request from said operator unit for such status information when received at the cable access unit.

14. A system as claimed in claim 1, further comprising at least one user device coupled to the cable access unit and adapted to receive at least one of communications and data over the network via the cable access unit.

15. A system as claimed in claim 14, wherein the at least one user device comprises a phone unit, a television, an answering machine, and a computer.

16. A method of remotely sensing the power supply states of communication cable access units coupled to a communications network, comprising:

operably coupling a plurality of communication cable access units to a communication network, the cable access units each coupled to a respective power supply powered by a main power source, and said power supply having a backup battery adapted to supply backup power to an associated cable access unit when the main power source fails;

monitoring power supply status information from at least one of the cable access units by:

generating a status information signal by the power supply associated with the cable access unit to be monitored indicating at least one of the presence of the backup battery and the power status of the backup battery when the main power fails,

obtaining, at the cable access unit, access information on whether the cable access unit is capable of obtaining the status information on the backup battery, and when so capable, acquiring said status information on the backup battery,

transmitting, from an operator unit to the cable access unit via the network, a request for the access information and status information from the cable access unit for transmission back to the operator unit via said network,

sending the access information back to the operator unit from the cable access unit via the network, and including the status information when the access information indicates the cable access unit is status information collection capable,

processing, at the operator unit, said access information, and also said status information when the access information indicates the cable access unit is status information collection capable, and

displaying an indication of the respective battery status information for an associated cable access unit on a user interface coupled to the operator unit.

17. A method as claimed in claim 16, further comprising generating status information by the power supply on the backup battery selected from at least one of backup battery on information, backup battery missing information, and backup battery needing replacement information.

18. A method as claimed in claim 17, further comprising generating by the operator unit an alarm message, including an identification of the associated cable access unit, on the user interface when status information on the backup battery as received from said cable access unit indicates at least one of a backup battery on, a backup battery missing, and a backup battery needing replacement condition for the monitored cable access unit.

19. A method as claimed in claim 18, further comprising acquiring backup battery status information from a plurality of cable access units located at respective different subscriber premises, and simultaneously displaying, on the user interface, individualized indications of the respective battery status conditions associated with the respective cable access units.

20. A method as claimed in claim 19, further comprising maintaining a count of the number of cable access units reporting a backup battery on condition within a predetermined service area.

21. A method as claimed in claim 20, further comprising displaying a generalized indication on the user interface of a service area wide warning condition in lieu of individualized indications for each cable access unit when the count of the number of cable access units reporting a backup battery on condition within the predetermined service area exceeds a predetermined value.

22. A method as claimed in claim 16, wherein said acquiring of the status information on the backup battery includes providing a hardware unit detecting and receiving the status information from the power supply, and providing a processor unit checking to determine whether the cable access unit can acquire the backup battery status information via the hardware unit, and when acquired, said processor unit retaining said status information until said request is received at the cable access unit from the operator unit.

23. A method as claimed in claim 16, wherein said obtaining of status information on the backup battery is performed on a periodic basis.

24. A method as claimed in claim 16, further comprising at least one user device coupled to the cable access unit and adapted to receive at least one of communications and data over the network via said cable access unit in which the user device is one of a phone unit, a television, an answering machine, and a computer.

25. An access unit for use in a communications network comprising:

processing circuitry having a first input, a first output, a second input, and a second output, said processing circuitry first input operably coupled to an operator unit to receive a power supply status query, said processing circuitry first output operably coupled to said operator unit to provide a power supply status thereto; and

a detection unit having a first input coupled to said processing circuitry second output to receive power supply status requests, said detection unit having a second input operably coupled to a power supply to monitor status of said power supply, said detection unit having a status output coupled to said processing circuitry second input to provide a monitored power supply status thereto.

26. A system for remote sensing of power supply states, said system comprising:
a communications network;
a power supply located at or near a customer's premises, said power supply powered
by a power source, said power supply having a backup power supply, said power supply
generating one or more power supply status indications;

a cable access unit coupled to said power supply, said cable access unit coupled to
said network, said cable access unit powered by said power supply, said cable access unit
monitoring one or more of said generated power supply status indications;

an operator unit coupled to said network, said operator unit communicating with said
cable access unit to ascertain at least one of said monitored power supply indications; and

a user interface coupled to said operator unit, said operator unit displaying on said
user interface an indication of at least one of said ascertained power supply indications.

27. A system as in claim 26, wherein said one or more generated power supply indications
is selected from one or more of backup-on, backup-missing, and backup-replace.

28. A system as in claim 27, wherein said communication by said operator unit is carried
out in a periodic manner.

29. A system as in claim 28, wherein said periodic communication is carried out by
pinging.

30. A system as in claim 29, wherein said backup-on power supply indication is generated in response to said backup power supply providing power to said cable access unit.

31. A system as in claim 30, wherein said backup-missing power supply indication is generated in response to said power supply no longer being coupled to said backup power supply.

32. A system as in claim 31, wherein said backup-replace power supply indication is generated in response to said battery backup supply being in a non-operational state.

33. A system as in claim 29, wherein said backup-missing power supply indication is generated in response to said power supply no longer being coupled to said backup power supply.

34. A system as in claim 29, wherein said backup-replace power supply indication is generated in response to said battery backup supply being in a non-operational state.

35. A method for remote sensing and display by an operator unit of power supply states of power supplies each having a respective backup power supply, each of said power supplies coupled to a respective cable access unit, each of said cable access units coupled to said operator unit, said operator unit coupled to a storage location, each of said power supplies
5 powered by a respective power source, said method comprising:

a) generating, by at least one of said power supplies, a respective power supply status in response to the occurrence of at least one predetermined condition associated with said respective backup power supply;

b) monitoring, by at least one of said cable access units, the power supply status of the
10 respective power supply;

c) reading from said storage location, by said operator unit, identifiers of at least one alarm condition and addresses of at least one of said cable access units to be monitored;

d) communicating with said one or more cable access units by said operator unit to ascertain the power supply status of said respective power supplies;

e) analyzing one or more of said communicated power supply statuses to determine
15 whether any alarm conditions have been generated by said power supplies; and

f) displaying by said operator unit, responsive to said analyzing indicating at least one alarm conditions have been generated, an indication of at least one alarm conditions and the respective generating power supply on a user interface associated with said operator unit.

20 36. A method as in claim 35, wherein said at least one predetermined condition includes the condition where said backup power supply is supplying power to said respective cable access unit .

37. A method as in claim 35, wherein said at least one predetermined condition includes the condition where said backup power supply is determined to be disconnected from said respective power supply.

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38. A method as in claim 35, wherein said at least one predetermined condition includes the condition where said backup power supply is determined to need replacement.

39. A method as in claim 35, wherein said step (d) of communicating comprises the steps of:

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i) pinging, by said operator unit, said at least one cable access units, and

ii) receiving, by said operator unit, a response indicating whether any of said at least one alarm condition have been generated.

40. A method as in claim 39, wherein said at least one predetermined condition includes the condition where said backup power supply is supplying power to said respective cable access unit .

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41. A method as in claim 39, wherein said at least one predetermined condition includes the condition where said backup power supply is determined to be disconnected from said respective power supply.

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42. A method as in claim 39, wherein said at least one predetermined condition includes

the condition where said backup power supply is determined to need replacement.

43. A computer program product for providing an indication on a user interface of alarm conditions of power supplies, said power supplies each having a backup power supply, said power supplies each coupled to a cable access unit, said cable access units coupled to an operator unit, said operator unit coupled to said user interface, said computer program product comprising a computer usable medium having a computer readable code thereon, said computer readable program code comprising:

computer readable program code means for generating, by one or more of said power supplies, alarm conditions in respective alarm locations when respective predetermined events occur;

computer readable program code means for monitoring, by one or more of said cable access units, respective ones of said power supplies to determine whether any said alarm conditions have been generated;

computer readable program code means for reading from a storage location, by said operator unit, identifiers of one or more said cable access units;

computer readable program code means for communicating with said identified cable access units by said operator unit to determine whether any of said identified cable access units indicate any of said alarm conditions have been generated; and

computer readable program code means for displaying by said operator unit, responsive to said communication, indications of said any generated alarm conditions and corresponding indicating said identified cable access unit on a user interface associated with said operator unit.

44. A computer program product as in claim 43, wherein said computer readable program code means for monitoring comprises:

computer readable program code means for pinging, by said operator unit, said cable access unit, and

computer readable program code means for receiving, by said operator unit, a response indicating said alarm condition has been generated.

45. A computer program product as in claim 44, wherein said computer readable program code means for generating comprises:

computer readable program code means for determining, by said power supply, whether said power supply is receiving power from said customer power supply, and

computer readable program code means for asserting, by said power supply, a first alarm condition by generating a first signal at a first location in response to said determination indicating said power supply is not receiving power from said customer power supply.

46. A computer program product as in claim 44, wherein said computer readable program code means for generating comprises:

computer readable program code means for determining, by said power supply, whether said power supply is uncoupled from said battery backup supply, and

5 computer readable program code means for asserting, by said power supply, a second alarm condition by generating a second signal at a second location in response to said determination indicating said power supply is not coupled to said battery backup supply.

47. A computer program product as in claim 44, wherein said computer readable program code means for generating comprises:

10 computer readable program code means for determining, by said power supply, whether said battery backup supply is non-operational, and

computer readable program code means for asserting, by said power supply, a third alarm condition by generating a third signal at a third location in response to said
15 determination indicating said power supply is not receiving power from said customer power supply.

48. An operator unit for use in a network comprising:

a control query output adapted to be operably coupled to one or more access units in
20 said network, said control query output to provide power supply status queries to said one or more access units;

an analyzation unit having a status reply input adapted to be operably coupled to said one or more access units, said status reply input to receive power supply status reply

messages from said one or more access units, said analyzation unit having an output to provide notice of any asserted alarm conditions; and

an operator interface having an input coupled to said analyzation unit output; said operator interface having an output to provide an alarm condition warning.

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49. An operator unit as in claim 48, wherein said operator interface output is one or more of a visual display, a speaker, and a tactile feedback device.

50. An operator unit as in claim 49, said operator unit further comprising:

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a counting unit having an input coupled to said analyzation unit output and an output to provide at least a partial count of the number of access units asserting an alarm condition, said operator interface having a count input coupled to said counting unit output, said operator interface warning output to provide at least one of an individual alarm condition warning and a multiple-access unit alarm condition warning.

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51. An operator unit as in claim 49 said operator unit further comprising:

a counting unit having an input coupled to said analyzation unit output and an output to provide at least a partial count of the number of access units asserting an alarm condition

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a gauge unit having an input coupled to said counting unit output and an output to provide a service-area wide alarm condition warning when said count equals or exceeds a predetermined count threshold, said gauge unit output coupled to said operator unit input, said operator interface warning output to provide at least one of an individual alarm condition warning and a multiple-access unit alarm condition warning.

52. An operator unit as in claim 49, wherein said alarm condition warning includes an identification of the associated access unit and at least one of a battery-on, a battery-missing, and a battery-failed alarm condition.

$\begin{array}{ccccccc} \text{H}_2\text{N}- & -\text{CH}_2- & -\text{C}(=\text{O})- & -\text{NH}- & -\text{C}(=\text{O})- & -\text{NH}- & -\text{C}(=\text{O})-\text{OH} \\ | & | & | & | & | & | & | \\ \text{R}_1 & \text{R}_2 & \text{R}_3 & \text{R}_4 & \text{R}_5 & \text{R}_6 & \end{array}$